

(12) UK Patent Application (19) GB (11) 2 040 676 A

(21) Application No 8002974

(22) Date of filing 29 Jan 1980

(30) Priority data

(31) 7903088

(32) 29 Jan 1979

(33) United Kingdom (GB)

(43) Application published
3 Sep 1980

(51) INT CL³

A47K 3/02 3/22

(52) Domestic classification

A4N 2B 2D1 4

(56) Documents cited

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GB 903823

(58) Field of search

A4N

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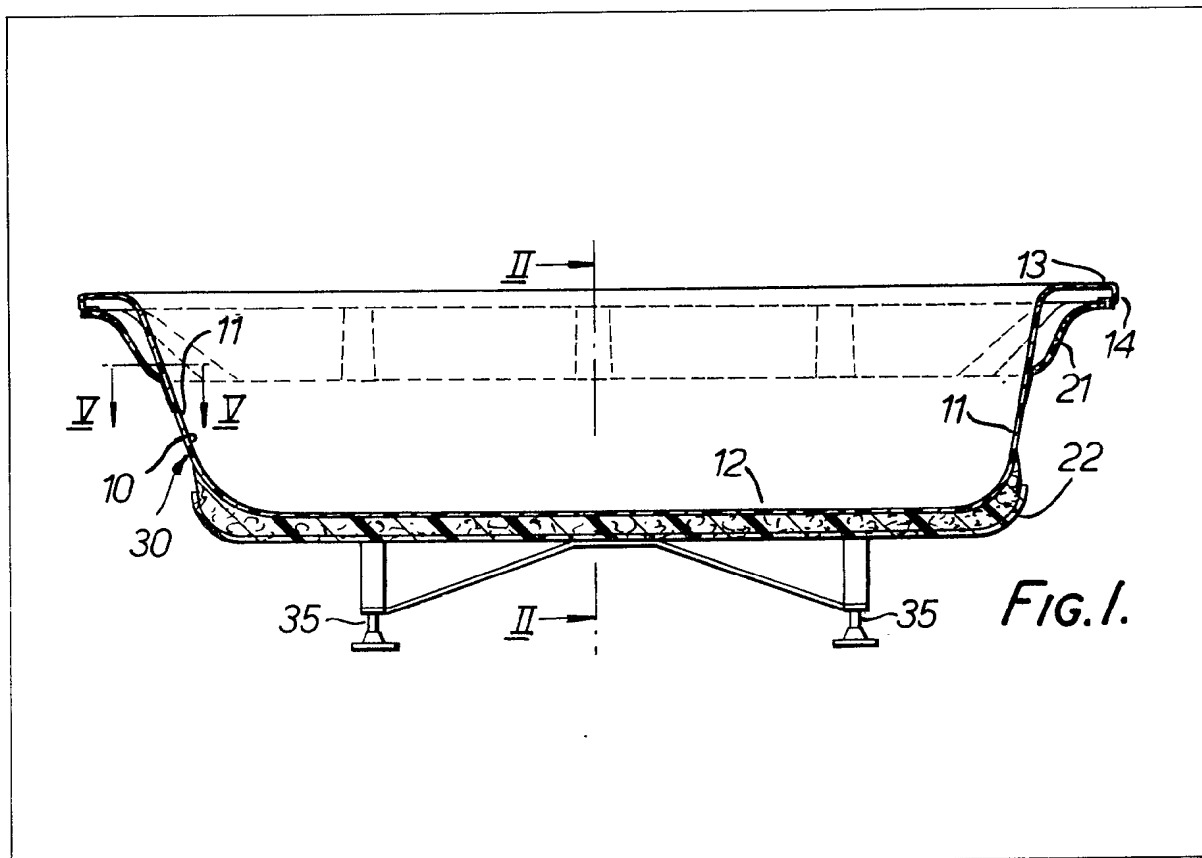
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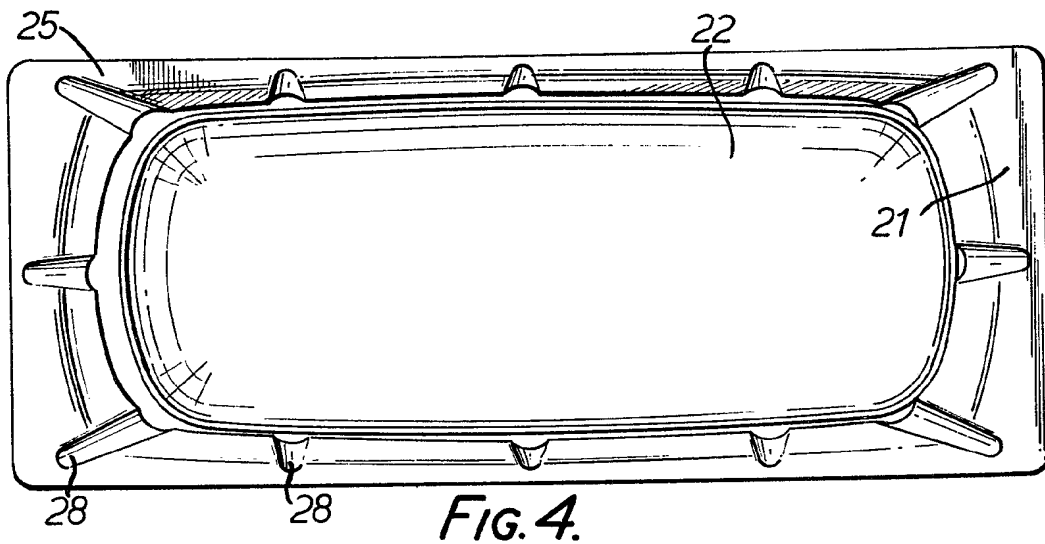
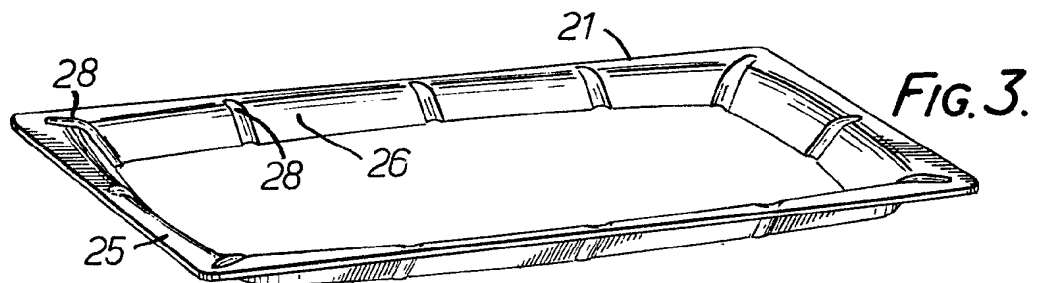
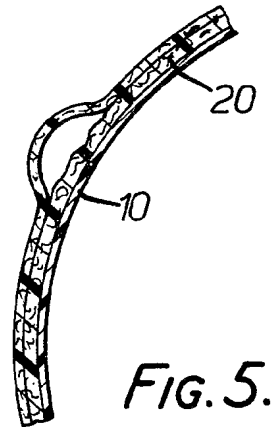
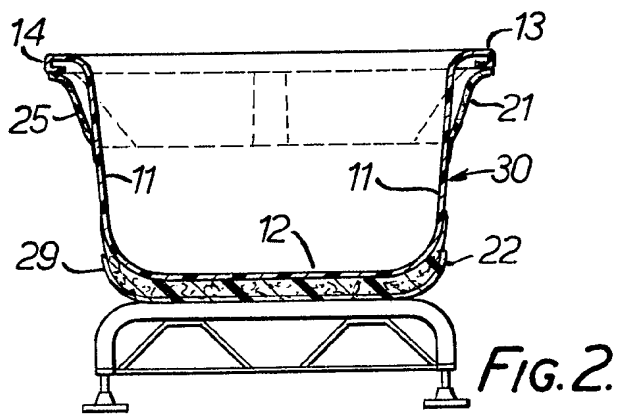
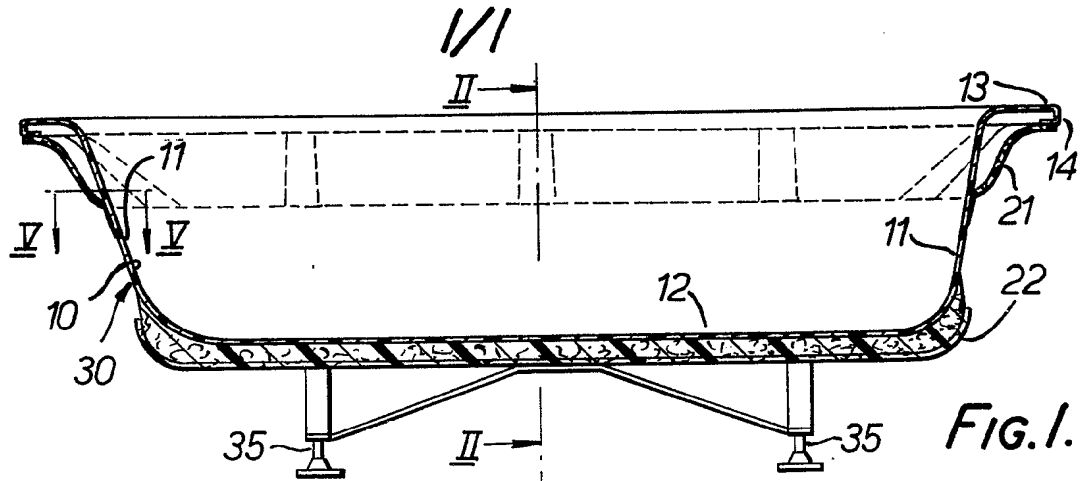
(54) Baths, shower trays and like toilet receptacles

(57) A bath or shower tray having a body or inner liner (10) formed of a synthetic plastics material is provided with an external layer of glassfibre reinforced plastics and includes upper and lower reinforcing shell sections (21) (22) each consisting also of glassfibre reinforced plastics and moulded respectively to fit the upper and lower parts of the main liner. The shells may alternatively be of metal and may be formed integrally.



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The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.



SPECIFICATION

Baths, shower trays and like toilet receptacles

5 This invention relates to the manufacture of baths, shower trays and like toilet receptacles which are formed at least in part of synthetic plastics and are intended in use to support the weight of a human being or other equivalent load.

10 It is well known to make such receptacles of synthetic plastics materials and it is common to provide an inner skin or liner formed of a glossy coloured plastics such as acrylic resin, moulded into the required shape and providing an attractive, 15 hygienic and generally acceptable surface. Such plastic liners or skins, formed of thermoplastic material, are usually not capable of supporting heavy localised loads and must be strengthened wherever such loads may appear. In the case of a 20 bath it is usual to reinforce the whole of the liner with a layer of glass-fibre reinforced plastic and, in addition, to provide a rigid timber or metal frame around the upper rim, and a one-piece board or plank of composition timber over the whole of the 25 flat bottom. The upper frame and the bottom board are joined by a metal frame or frames and also carry the supporting feet and in this way the main sections of the bath are rigidified and the zones where heavy weights may be applied are strengthened. The 30 construction, however, is time consuming and the end product still has considerable flexibility and points of weakness. It is an object of the present invention to provide an improved construction which will overcome some of these existing problems. 35

Broadly stated, the invention consists in a bath, shower tray, or like toilet receptacle, comprising an inner liner, formed of a synthetic plastic material, and an outer reinforcing shell, in one or more parts, 40 preformed in shape to conform at least partly to the inner liner, and rigidly attached or bonded thereto.

Since the reinforcing shell is preformed accurately to shape it can be fitted to the inner liner accurately and will provide support and reinforcing strength 45 distributed over a large area. The preforming process may be a moulding operation, thus providing relatively inexpensive, high speed production.

The shell preferably includes strengthening or stiffening ribs, grooves, corrugations or other 50 shaped strength elements. These may be additional elements attached to or moulded into the shell or they may be in the form of shaped deformations produced in the moulding of the shell.

The shell is conveniently formed of a rigid synthetic plastics composition and it preferably includes 55 fibre reinforcement. Conveniently, and after the shell is bonded to the liner, an overlying layer of synthetic plastics with fibre reinforcement can be added to achieve any standard of structural performance, if 60 required.

The complete receptacle, including the liner and shell, preferably includes a plurality of support feet, attached directly or indirectly to the bottom of the 65

strengthen the rim of the receptacle and it may be arranged to provide gaps or apertures, around the receptacle, and the overlying layer extends through or into these gaps or apertures.

70 The invention may be performed in various ways and one specific embodiment, with some possible modifications, will now be described by way of example, with reference to the accompanying drawings, in which:

75 *Figure 1* is a sectional side elevation of a bath constructed in accordance with the invention, *Figure 2* is a vertical section on the line II-II in *Figure 1*,

Figure 3 is a perspective view of the upper part of 80 the reinforcing shell,

Figure 4 is a plan view of the upper and lower parts of the reinforcing shell positioned one within the other, and

Figure 5 is a fragmentary horizontal cross-section 85 on a somewhat enlarged scale on the line V-V of *Figure 1*.

In this example the invention is applied to the construction of a bath of conventional shape. The construction includes an inner liner 10 formed of an acrylic resin such as that sold under the Registered Trade Mark "Perspex." This is a thermo-plastic material which is heated and vacuum formed when 90 soft into the required shape. The result is a receptacle including side walls 11, a generally flat bottom 12 and a surrounding upper rim 13 with downturned edges 14. In this particular example the edge is rectangular but other shapes are commonplace. 95

The acrylic resin liner so formed is glossy and attractive but has little strength, particularly in the 100 side walls 11 and bottom 12, which are seriously reduced in thickness during the vacuum forming. A layer of glass-fibre reinforced plastic is first applied over the whole external surface of the bath. This layer 20 preferably includes a type C Polyester selected to provide good adhesion to the acrylic liner. 105

Independently of the liner a one or two-part reinforcing shell is preformed, comprising an upper shell section 21 and optionally a lower section 22. 110

Each of these consists of glass-fibres impregnated with a polyester resin, the shell sections being preferably moulded accurately to the required shape and cured or allowed to harden. The upper shell section 21, as illustrated in *Figure 3*, includes a flat 115 surrounding portion 25 which is designed to fit under the rim of the bath and a depending skirt 26 designed to fit around the upper parts of the side wall 11 of the bath. This reinforcing shell is moulded with a series of reinforcing grooves or ribs 28, which 120 extend across the flat part 25 and down the skirt 26. These are moulded into the shell during manufacture and require no special laborious manual shaping. The base 22 of the shell is generally flat with shallow upturned edge 29 designed to fit around the 125 lower part of the bath and to strengthen the lower corners. It will be noticed from *Figures 1* and *2* that a gap 30 may be left around the bath between the upper and lower shells. The lower shell may be formed with reinforcing grooves.

130 When the two parts are rigid a layer of glass fibre

reinforced plastics is applied to the outer surface of the bath liner and the shell sections are fitted onto the bath in the positions shown in Figures 1 and 2. Here the shell sections bed down closely onto the bath lining. Optionally a layer of glass-fibre reinforced polyester resin is then applied overall and particularly around the rim and in the region of any gap 30, thus effectively adding to the rigidisation effect of the bath lining. A separate support or Feet 35 are attached directly to the bottom shell 22 and this may be achieved during the moulding or forming of the shell part 22.

It will be noted that there is no separate frame provided around the rim and particularly no fabricated timber or metal frame. Furthermore, there is no external framework connecting the rim of the bath to the base, and the feet or support framework are fitted directly to the base shell.

In place of the fibre reinforced plastic shells described it may be preferable, in some cases, to use preformed sheet metal shells. It may also be preferred, in some cases, to use a one-piece shell extending over substantially the whole of the bath or tray, but this will preferably have a number of apertures to allow an overlying fibre reinforcing layer to bond onto the inner liner or skin.

CLAIMS

1. A bath, shower tray, or like toilet receptacle, comprising an inner liner, formed of a synthetic plastics material, and an outer reinforcing shell, in one or more parts, preformed in shape to conform at least partly to the inner liner, and rigidly attached or bonded thereto.

2. A toilet receptacle according to claim 1, in which the shell is formed of a rigid synthetic plastics composition.

3. A toilet receptacle according to claim 2, in which the shell includes fibre reinforcement.

4. A toilet receptacle according to any of the preceding claims, in which the shell is bonded to the liner by means including an overlying layer of synthetic plastics with fibre reinforcement.

5. A toilet receptacle according to any of the preceding claims, in which the shell includes strengthening or stiffening ribs, grooves, corrugations or other shaped strength elements.

6. A toilet receptacle according to any of the preceding claims, including a plurality of support feet, attached directly or indirectly to the bottom of the shell.

7. A toilet receptacle according to any of the preceding claims, in which the shell is shaped and positioned to strengthen the rim of the receptacle.

8. A toilet receptacle according to claim 4, in which the shell provides gaps or apertures, around the receptacle, and the overlying layer extends through or into those gaps or apertures.

9. A bath substantially as described herein with reference to the accompanying drawings.